Markus Fensterer
Engineer x-cellent
@mwindower

Stefan Majer
CTO x-cellent
@5majer

Network Design for a bare metal cloud

Intro

x-cellent technologies

- IT-consultancy for finance industry
- tech focus: DevOps + Deep Linux Know How

Goals

k8s as a service offering

automated k8s cluster lifecycle

cloud-native networking

Why bare metal?

- licensing
- noisy neighbors
- performance
- cpu bugs
- european regulations (BSI, EZB)

Ideas for bare metal

1. let a third-party deploy an API
2. use an existing solution
3. DIY

...but: networking has to be solved in each of them

Cloud-native networking

Pain of L2:

- Spanning Tree Protocol
- broadcast traffic
- link aggregation
- VLANs for tenant separation

L2 has reached “end-of-life” in the datacenter

transition to L3 only

Cloud-native networking

Automation
PXE-Boot-Setup
Separation of tenants
IP Address Mgmt
Cabling Detection

Internet Access
Internet Reachability
High Availability
Load-Balancing
Firewalling

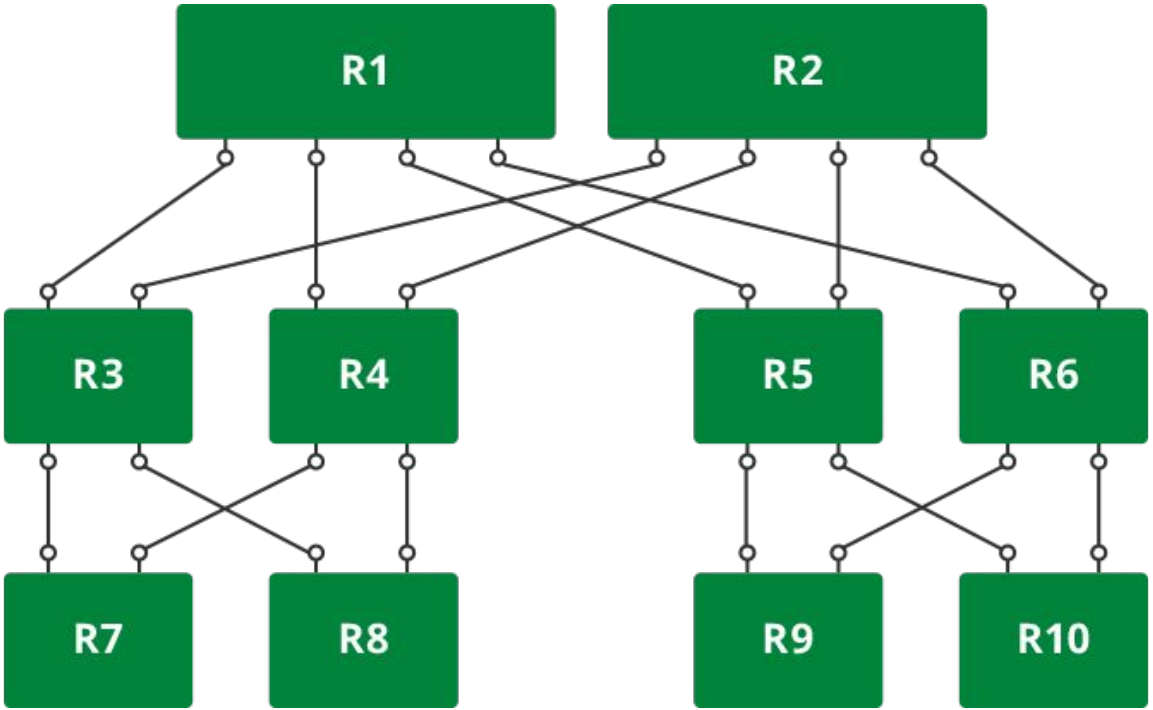
Cloud-native networking

Automation	*Cumulus Linux, Control Plane@Switch*
PXE-Boot-Setup	*Google pixiecore, u-root*
Separation of tenants	*VRF, EVPN*
IP Address Mgmt	*DigitalOcean netbox*
Cabling Detection	*eBPF filter for LLDP*

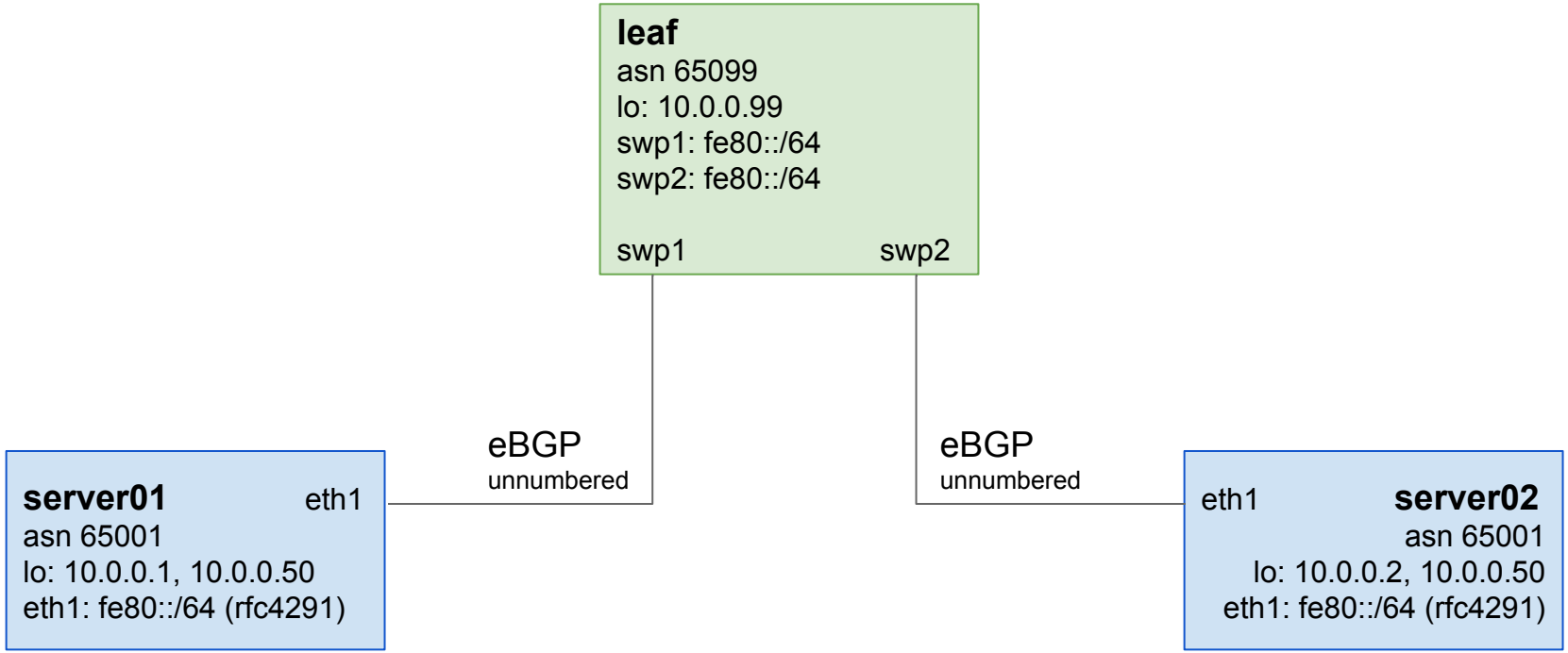
Cloud-native networking

eBGP	Internet Access
eBGP	Internet Reachability
CLOS, 2x link, ROH	High Availability
base: Anycast & ECMP	Load-Balancing
yet undecided	Firewalling

CLOS-Topology



Anycast & ECMP



Demo

https://github.com/x-cellent/ecmp-demo

Q/A

we are hiring

Links

Cumulus Linux: https://cumulusnetworks.com/

Pixiecore: https://github.com/google/netboot/tree/master/pixiecore

u-root: https://github.com/u-root/u-root

netbox: https://github.com/digitalocean/netbox

FRRouting: https://github.com/FRRouting/frr

Demo-Repo: https://github.com/x-cellent/ecmp-demo